Organization

Environmental Energy Technologies Area

Description

The Grid Integration Group's (GIG) microgrid team within the Environmental Energy Technologies Area is seeking a Postdoc with expertise in Energy and Environmental Operations Research, Microgrid Controls, and User Interface Programming. The applicant should have a strong interest in numerical modeling of energy conversion technologies and a high proficiency with the General Algebraic Modeling System (GAMS) as well as programming languages (VBNet, HTML 5, Java). The Distributed Energy Resources Customer Adoption Model (DER-CAM), which is written on the GAMS platform has been developed for many years and is being expanding to address complex applications of DER optimization, scheduling, and control. Current development work is focused on microgrid controller modules, power flow optimization, as well as web based Graphical User Interface programming for DER-CAM.

This position offers a stimulating environment for working with a highly skilled interdisciplinary and multi-cultural team and will require strong motivation and excellent oral and written communication skills. Lawrence Berkeley National Laboratory is a renowned center of scientific expertise in the many facets of energy related fundamental and applied science. To learn more about our research work, please visit https://building-microgrid.lbl.gov/.

The successful candidate will develop new modules which expand the functionality of internally developed models, collect data and generate results to test and validate new models (e.g. stochastic optimization). The candidate will also construct flexible innovative frameworks and communication interfaces for models based on project-specific constraints. This work emphasizes accessibility for users and integration of models with building controllers and SCADA systems for automated information delivery and control. The final candidate needs to have excellent experience in programming languages as GAMS, VBNet, Java, HTML5, Python, and databases.

As a Postdoc you will:
- Support development of new optimization modules which expand the functionality of internally developed models (e.g. stochastic capabilities, power flow optimization). Support the microgrid controller work for military and commercial sites. Collect data and generate results to test and validate new models.
- Develop new graphical modules/interfaces for DER-CAM, based on VBNet, HTML, or Java which support the functionality of internally developed MILP DER-CAM models.
- Lead the web-based Graphical User Interface programming of DER-CAM and build related databases.
- Program flexible innovative frameworks and communication interfaces for models based on project-specific constraints. This work emphasizes accessibility for users and integration of models with building controllers and SCADA systems for automated information delivery and control.

- Implement new techniques in linear-programs to allow for non-linear technology constraints to be captured within the MILP models, to improve overall accuracy, reduce model runtime and expand applicability.
- Work with DER-CAM clients, communities, and microgrid developers to improve the web version of DER-CAM and support them on tool related issues.
- Generate original materials, support analysis and results for journal and conference publications.
- Act as liaison between scientist and affiliates/guests/students and group members.
- Work with project partners in the U.S and Europe.
- Support DER-CAM user management, maintain the DER-CAM user base and resolve bugs for the users.

Qualifications:
- Electrical Engineering or Computer Science PhD with experience in microgrid design and/or Operations Research plus proven experience in programming with GAMS, VBNet, HTML5, and Java.
- Demonstrated ability to develop flexible, well-structured code to address diverse research questions and industry grade databases.
- High proficiency in power system analyses.
- Substantial knowledge in programming languages such as Python, GAMS, VBNet, HTML5, Java.
- Scientific understanding of operations research and optimization concepts.
- Familiarity with communication standards.
- Excellent record of publications in the area of microgrids and DER optimization
- High proficiency with standard analysis tools as Excel, Word, PowerPoint, Access, etc.
- Demonstrated ability in data visualization. Able to generate graphics that convey complex ideas and data elegantly.